



# DOE Year-End Energy Reporting & Requirements

Federal Energy Management Program  
Office of Energy Efficiency and Renewable Energy  
U. S. Department of Energy

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- Data Sources
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  - › Individual DOE Site narratives



## Background

All Federal agencies are required to report on annual energy and water management activities as mandated by:

- › National Energy Conservation Policy Act (NECPA)
- › Energy Policy Act of 2005 (EPAAct '05)
- › Energy Independence and Security Act of 2007 (EISA)
- › Executive Order (E.O.) 13423 *Strengthening Federal Environmental, Energy, and Transportation Management*

The report, *Annual Report to Congress on Federal Government Energy Management* is distributed to:

- › House Committees on Appropriations, Energy and Commerce, Government Reform, and Science
- › Senate Committees on Appropriations, Energy and Natural Resources, and Homeland Security and Governmental Affairs





## Performance Metrics

DOE's Annual Energy Report aggregates each DOE sites' information and calculates DOE's performance on the following metrics:

- › Energy Intensity (Btu/Sf<sup>2</sup>) reduction performance to date relative to fiscal year 2003 baseline
- › Potable Water Intensity (Gal/Sf<sup>2</sup>) reduction performance to date relative to fiscal year 2007 baseline
- › Renewable Energy purchases and generation performance relative to current year electricity consumption
- › Metering, installation of standard and advanced to the maximum extent practicable by October 1, 2012
- › New Federal Building energy efficiency standards designed to achieve energy consumption levels that are at least 30 percent below the levels established in the ASHRAE Standard 90.1



# FY 2009 Energy Management Scorecard

	CURRENT STATUS (As of January 1, 2010) <sup>1</sup>		PROGRESS	COMMENTS	
<b>ENERGY MANAGEMENT</b>  <b>Sustainability Officer:</b> Daniel Poneman, Deputy Secretary  <b>Lead DOE Analyst:</b> Richard Kidd  <b>Lead OMB Analyst:</b> Cyndi Vallina	  Yellow ↓	<ul style="list-style-type: none"><li>Reduction in energy intensity in goal-subject facilities compared with 2003:     <u>X</u> at least 12 percent and on track for 30 percent in 2015 (G)     ___ at least 9 percent (Y)</li><li>Use of renewable energy as a percent of facility electricity use:     <u>X</u> 1.5 percent from <u>new</u> sources (thermal, mechanical, or electric) AND total of 3 percent from renewable <u>electricity</u> sources (G)     ___ 3 percent from any renewable thermal, mechanical or electric renewable energy source (Y)     ___ Less than 3 percent from any renewable energy sources (R)</li><li>Individually meter 100 percent of appropriate facilities for electricity by 2012; and for natural gas and steam by 2016:     <u>X</u> Metered at least 25 percent of appropriate facilities for electricity (G)     ___ Metered at least 10 percent of appropriate facilities for electricity (Y)</li><li>Reduction in water intensity compared with 2007:     ___ at least 4 percent and on track for 16 percent in 2015 (G)     <u>X</u> at least 2 percent (Y)</li><li>Percent of new building designs begun since October 1, 2006 that are 30 percent more energy efficient than relevant code:     <u>X</u> 100 percent (G)     ___ 75 percent (Y)</li></ul>	  Green	<p><u>Actions taken since July 1, 2009:</u></p> <ul style="list-style-type: none"><li>Updated executable plans representing more than 40 DOE sites identifying DOE-wide funding requirement and proposed financing approach for EE/RE projects; submitted list of site-level projects for attaining EE/RE goals to OMB.</li><li>Awarded more than \$50 million in ESPC projects.</li><li>Submitted a report to OMB on DOE activities related to EISA Title V (sections 517, 518, 521, 524, and 525) and provided draft FY 2008 Report to Congress to OMB by 9/30/09.</li><li>Completed FY09 energy management reporting requirements.</li></ul> <p><u>Planned actions for next six months:</u></p> <ul style="list-style-type: none"><li>Complete the new Site Data Package approach at a DOE site that would be shared with ESCOs to inform the Preliminary Assessment for potential ESPC projects.</li><li>Prepare a report on executable plans by 6/2/10 identifying EE/RE projects and required funding for major DOE sites that will address plans to meet energy efficiency, renewable energy, water intensity, and other goals.</li><li>Complete water audit at Y-12 Plant to identify potential water conservation measures.</li><li>Submit by 6/4/10 agency GHG emission reduction goal for Scope 3 &amp; Strategic Sustainability Performance Plan.</li><li>Update findings of evaluations in ≥50% covered facilities by 6/30/10.</li><li>Finalize and submit FY 2008 Energy Report to Congress by 5/1/10.</li></ul>	<ul style="list-style-type: none"><li>DOE status falls to Yellow as DOE reduced water intensity only 2.6% from 2007, which is lower than expected due to its re-baselining efforts.</li><li>DOE progress remains Green, as it completed or exceeded 4 planned actions for the past 6 months.</li><li>DOE reduced energy intensity 17.2% from 2003; 14.1% without credit for renewable energy purchases.</li><li>DOE used eligible renewable electricity equivalent to 4.2% of its total electricity use (3.8% from new sources).</li><li>DOE metered more than 90% of appropriate facilities for electricity.</li><li>DOE approved water conservation projects at over 5 DOE sites.</li><li>DOE invested almost \$233 million in energy efficiency, 56.6% of its facility energy costs—almost entirely through ESPCs.</li><li>DOE broke ground on the Savannah River Biomass Steam Plant, estimated to save \$34 million a year in energy, operations, and maintenance costs.</li><li>Lawrence Livermore National Laboratory (LLNL) achieved LEED Gold certification for its TeraScale Simulation Facility, a 253,000 square foot facility; the third LLNL building to be LEED-certified and the first gold rating.</li><li><b>DOE committed to reducing scope 1 &amp; 2 GHG emissions by 25% in 2020 from 2008.</b></li></ul>

<sup>1</sup> Status is updated once annually (Jan 1) to reflect performance data collected at the end of each fiscal year. Progress is assessed twice annually (Jan and July). Quantitative standards for success for Yellow and Green will increase each year in accordance with new statutory or EO requirements.



## Data Sources

There are several key databases and reports from which FEMP compiles data to produce DOE's Annual Energy Reports. These consist of:

- › Facility Information Management System (FIMS)
- › Energy Management System 4 (EMS4)
- › Executable Plan's Consolidated Energy Data Report (CEDR) Excel workbook
- › Individual DOE Site narratives



## Facility Information Management System (FIMS)

At the moment there are three main FIMS reports that are used for DOE's energy management. These reports capture information on assets designated as energy consuming. The reports are:

- › FIMS 008: Captures information on energy consuming goal subject buildings and trailers
- › FIMS 047: Captures information on energy consuming other structures and facilities (OSF)
- › FIMS 063: Captures information on energy consuming goal excluded buildings and trailers

The screenshot shows the FIMS web interface. At the top, there are three main tabs: **Property**, **Administration**, and **Reports**. Under the **Administration** tab, there are several sub-tabs: **Ad Hoc**, **Ad Hoc-Hist**, **Buildings**, **Land**, **OSF**, **Trailers**, **Maintenance**, and **Special**. The **Special** tab is circled in red. Below the tabs, there is a list of reports: [060 - Owned STARS Information Report \(incl cap / not cap cost\)](#), [062 - Expired Ingrant Report](#), [063 - Energy Consuming Excluded Facilities Report](#), and [065 - Notes Detail Report](#). The [063 - Energy Consuming Excluded Facilities Report](#) is circled in red. A red box with a red border contains the text: "Reports 008 and 047 are in the Buildings and OSF tabs, respectively." Two red arrows point from this box to the **Buildings** and **OSF** tabs.



## Facility Information Management System (FIMS)

FIMS report 063, is an important report in that it identifies DOE's energy intensity goal exclusions. Per DOE Order 430.2B:

- a. Any Site seeking to exclude buildings, must submit an annual Exclusion Self-Certification to FEMP, for which this report serves as the list of excluded buildings
- b. An Excluded Building should, to the extent practicable, be separately metered
- c. Site should provide third party verification to FEMP that each Excluded Building has undergone a comprehensive energy audit and implemented all practicable, life-cycle cost-effective energy conservation measures within the past four years
- d. An exclusion applies to a single building and not the entire facility in which the building is located





## Facility Information Management System (FIMS)

Recommended data quality checks prior to FIMS snapshot in mid November for energy consuming assets:

- › Ensure the square footage for goal and excluded added to the gross square footage of the asset.

prop_property_type	pbld_ec_bldg_fac	pbld_ec_metered	pbld_meters_1	pbld_gross_sqft	check
B	29011	22221	None	51398	166
B	192598	48000	None	240598	0
B	0	693002	None	693172	170

- › Review justifications for exclusions and ensure that the exclusion is still valid and applicable. If you have questions in regards to the justification for an exclusion, contact your Program Office and FEMP for clarification.



## Energy Management System 4 (EMS4)

EMS4 is DOE's corporate database for energy and water consumption. The system has four main categories:

- › Buildings -- Energy consumption and cost for goal subject assets
- › Excluded -- Energy consumption and cost for goal excluded assets
- › Vehicles and Equipment -- Non-fleet fuel consumption and cost
- › Water -- Water consumption and cost for all assets

Information is entered on a quarterly basis and by the type of fuel consumed (e.g. electricity, natural gas, steam). Consumption and cost information are based on utility bills and meter readings, while square footage is based on FIMS reports 008, 047, and 063.



## Energy Management System 4 (EMS4)

[Main Data Entry](#) [Reports](#) [Change User Password](#) [PDF File](#) [Log Off](#)

### EMS Data Entry

#### CATEGORIES

BUILDINGS  
EXCLUDED  
VEHICLES AND EQUIPMENT  
WATER

Site:

Fiscal Year:  Quarter:

#### Subcategories

Electricity-MWH  
Fuel Oil-(K Gal)  
Natural Gas-(MCF)  
LPG-(K Gal)  
Coal-Short Tons  
Steam-(Btu X 10 9)  
Other-(Btu X 10 9)  
Sq. Ft. (x 1000)  
Purch Renew Electric-MWH  
Purch Renew Other-BBtu

### BUILDINGS

*All square footage data entry is performed by FEMP based on data taken from FIMS.*

	2009 - Qtr: 1	2010 - Qtr: 1
Amount	0.0	<input type="text" value="0.0"/>
Cost (x \$1000)	0.0	<input type="text" value="0.0"/>

Explanation:



## Energy Management System 4 (EMS4)

Produced: 06/08/2010								
Energy Consumption and Cost Report								
Headquarters Summary			Field Element:					
Quarter 1 - 4			Program Office:					
	Consumption					Cost		
	2003		2009			(x 1000)		
	Standard Units	BTU x 10 9	Standard Units	BTU x 10 9	% Change	2003	2009	% Change
<b>BUILDINGS</b>								
Electricity-MWH	3,812,463.550	13,008.118	2,915,529.09	9,947.786	-23.53%	168,748.23	188,112.40	11.48%
Fuel Oil-(K Gal)	10,589.956	1,468.827	7,280.989	1,009.870	-31.25%	10,010.216	12,010.424	19.98%
Natural Gas-(MCF)	5,638,725.721	5,813.529	4,657,731.15	4,802.119	-17.4%	32,349.534	29,454.863	-8.95%
LPG-(K Gal)	696.262	66.494	589.300	56.279	-15.36%	605.080	1,079.573	78.42%
Coal-Short Tons	79,697.096	1,958.954	63,127.500	1,551.673	-20.79%	3,698.155	8,317.449	124.91%
Steam-(Btu X 10 9)	1,508.327	1,508.327	1,052.821	1,052.820	-30.2%	13,379.726	19,338.689	44.54%
Other-(Btu X 10 9)	62.982	62.982	230.998	230.998	266.77%	1,054.310	1,570.690	48.98%
Sq. Ft. (x 1000)	0.000	0.000	0.000	0.000	0.0%	0.000	0.000	0.0%
Total :		23,887.231		18,651.545	-21.92%	229,845.26	259,884.09	13.07%
Square Footage		105,781.931		99,566.983	-5.88%			
Energy/1000 Sqft		225.816		187.327	-17.04%			
Subtotal		23,887.231		18,651.545	-21.92%	229,845.26	259,884.09	13.07%
Total (BTUs)		23,887.231		18,651.545	-21.92%	229,845.26	259,884.09	13.07%



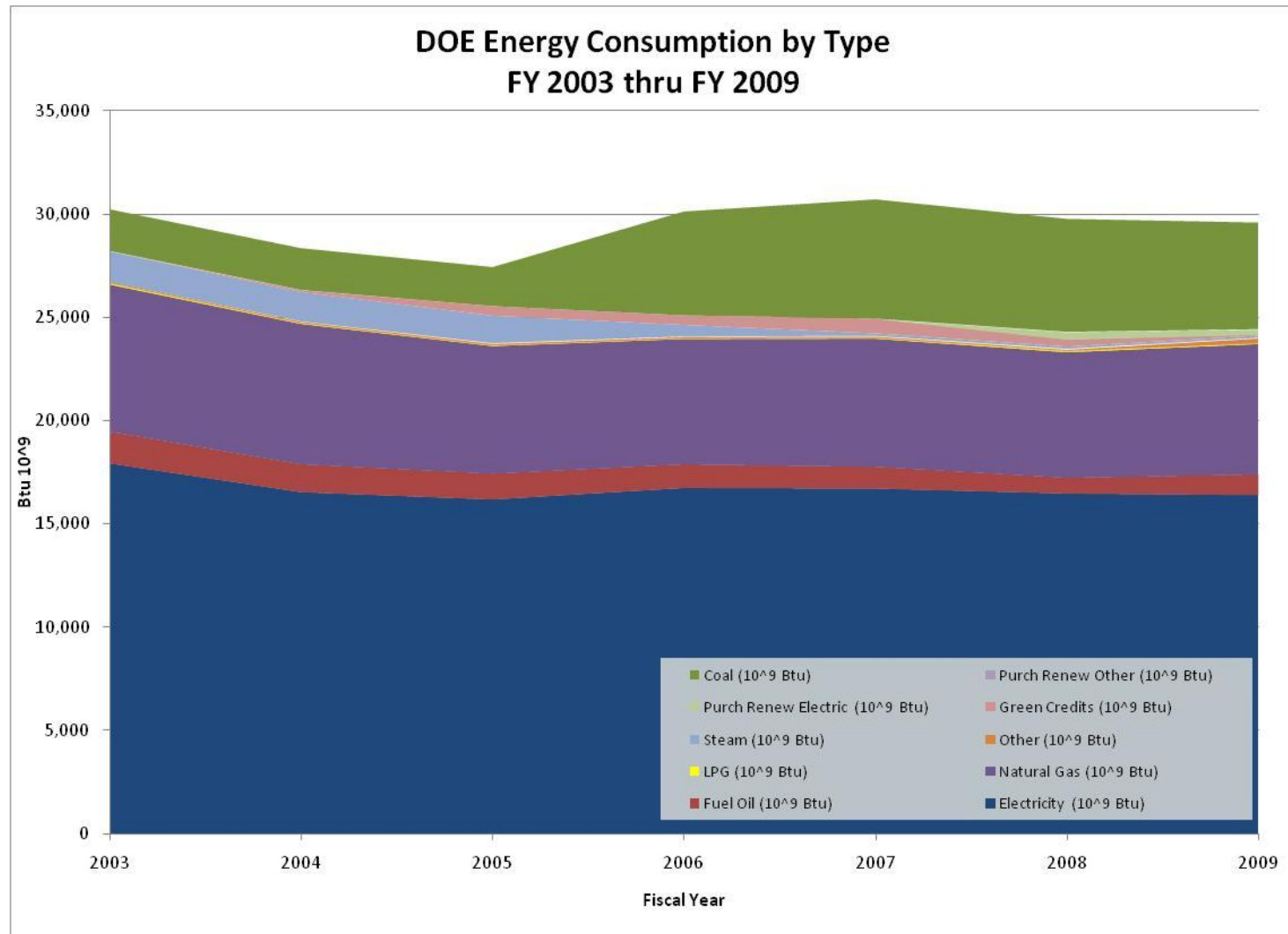
## Energy Management System 4 (EMS4)

Recommended data quality checks prior to EMS4 snapshot in mid November for consumption and cost:

- › Check for order of magnitude errors
- › Ensure data has been entered for all four quarters
- › Provide an explanation for changes greater than or less than 10%
- › Ensure the information is for consumption and not inventory
- › Make sure Renewable Energy Credits have not been entered as Purchased Renewable
- › Graph the data and if the information is correct be able to tell the story behind the trend(s)



## Energy Management System 4 (EMS4)





## Executable Plan's Consolidated Energy Data Report

The CEDR is an Excel workbook that captures information for each site's Annual Energy Management Report and Executable Plan. The major elements of the CEDR not captured in a database are:

- › On-site renewable energy generation
- › Direct and financed investments in energy efficiency
- › Advanced and standard metering
- › Training
- › New building construction and major renovations
- › High Performance and Sustainable Buildings status
- › Potential conservation and renewable energy measures



## Individual DOE Site Narratives

Site narratives complement the quantitative data in the CEDRs by providing:

- › Descriptions of major renewable energy systems and/or efficiency measures implemented
- › Best practices or lessons learned
- › Justification/rational for why they may not meet a goal
- › Local or State requirements impacting the site
- › Integration into the Environmental Management Systems (EMS)





**Thank you!!**